

REMARKS/ARGUMENTS

Claims 1-20 are currently pending in the application. Applicant re-submits the claims without amendment.

Claims 1-20 are Allowable over the Proposed Lindenmeier-Lindsay Combination

Claims 1-20 have been rejected under 35 U.S.C. § 103(a) as allegedly being obvious over U.S. Patent No. 6,768,457 issued to Lindenmeier in view of U.S. Patent No. 6,085,076 issued to Lindsay et al. Applicant respectfully disagrees with the Examiner and traverse the rejections set forth above.

A. The Proposed Combination Fails to Disclose, Teach, or Suggest Limitations Recited in the Independent Claims

To establish a *prima facie* case of obviousness, "the prior art must teach or suggest all the claim limitations." MPEP § 2143; see also MPEP § 2143.03 ("To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art.").

Lindenmeier and Lindsay, alone or in combination, fail to disclose a number of limitations in the pending claims, as set forth below.

A.1. Selecting Antenna During Frame Preamble for Receipt of Wireless Frame

(Independent Claims 1, 15 and 20)

The claimed subject matter includes analyzing RF signals corresponding to the preamble of a wireless frame, as transduced by a plurality of antennas, in order to select

the antenna that will be used to receive the remainder of the wireless frame. Specifically, independent claim 1 includes "an antenna selection module operative, during receipt of the preamble of a wireless frame, to 1) provide control signals to the switch designating selected directional antennas in the plurality of directional antennas, evaluate the respective output signals provided by the selected antennas, and select a directional antenna from the plurality of directional antennas for receiving the radio frequency signal associated with the wireless frame. Independent claim 20 includes similar language to the foregoing limitations of claim 1. Additionally, claim 15 includes the following "during receipt of the preamble of the frame, selecting one from the plurality of the directional antennas based on at least one attribute of the respective signals transduced by the antennas;" and "switching to the selected directional antenna for receipt of the remainder of the frame."

Neither Lindenmeier nor Lindsay disclose or suggest the foregoing limitations. As the Examiner admits at page 3 of the latest Office Action, Lindsay does not teach the selection of antennas during receipt of, and based on analysis of signals corresponding to, the preamble of a wireless frame. Rather, the Examiner relies on Lindsay as allegedly teaching "use of preamble in selection of received signals." Office Action at 3. In relying on Lindsay as allegedly providing the subject matter lacking in Lindenmeier, the Examiner omits to fully appreciate all the limitations of the pending claims. See MPEP § 2143.03. As discussed above, the claimed subject matter is directed to selecting a directional antenna, during receipt of a wireless frame preamble, that will be used to receive the rest of the wireless frame to which the preamble corresponds. Lindsay does not disclose this limitation. Rather, Lindsay discloses a system that selects an antenna for receipt of wireless transmissions based in part on examination of the preambles of TDM frames in a Time Division Multiplexing system. However, Lindsay does not disclose selection of a

directional antenna, during receipt of the preamble of a wireless frame, for the remainder of the same frame. Rather, Lindsay discloses a system where signal attributes detected during the preamble form part of the antenna selection decision for the next TDM frame. For example, antenna selection is also based on evaluation of error checking codes (e.g., CRC), which requires receipt of the entire frame. Accordingly, antenna selection in Lindsay, for a given TDM frame, is not performed during receipt of its preamble as disclosed and claimed.

A.2. Directional Antennas Having Substantially Non-Overlapping Antenna

Patterns And Peak Gains Oriented Radially And Outwardly About An Axis

(Independent Claims 1, 15 and 20)

As set forth above, claims 1, 15 and 20 also include a plurality of directional antennas having substantially non-overlapping antenna patterns, and whose respective peak gains are oriented radially and outwardly about an axis.

Neither Lindenmeier nor Lindsay teaches a plurality of directional antennas having substantially non-overlapping antenna patterns, and whose respective peak gains are oriented radially and outwardly about an axis. Rather, Lindenmeier appears to disclose a plurality of antennas disposed around circular perimeter or similar arrangement, where the peak gains of the antennas are oriented to point inwardly (see Figures 5b, 7, 8a, 8b, 9a&b, and 10a&b, and accompanying description of Lindenmeier). In addition, neither Lindenmeier nor Lindsay disclose or suggest a plurality of directional, radially-oriented antennas wherein the peak gains of the plurality of antennas are offset relative to each other at an angle substantially equal to $360/N$, where N is the number of directional

antennas in the plurality of directional antennas.

A.3. Identifying/Recovering Frames or Packets from Digital Data Streams
(Claims 4 and 16)

Claim 4 includes "a data link control unit operative to process the digital data streams and identify frames from the digital data streams." Claim 16 provides "demodulating the signal to provide a digital data stream," and "recovering a data packet from the digital data stream."

Despite the Examiner's contentions, Lindenmeier does not disclose these limitations. See Office Action at 4. Rather, the passage of Lindenmeier cited by the Examiner merely discloses the identification of QPSK and FDM symbols in radio signals. Such symbols are not frames or packets within the meaning of the claim language. For example, such symbols do not include preambles.

A.4. Storing Identified Directional Antenna with the Source Address of the Frame

(Claim 5, 6, 7 and 8)

Claim 5 of the application states that "the antenna selection module is further operative to identify the selected directional antenna to the data link control unit, and wherein the identified frames include a source address, and wherein the data link control unit is operative to store the identified directional antenna in association with the source address in the frames in a data structure."

The passage of Lindenmeier cited by the Examiner (basically an entire column of text) does not disclose this limitation. Rather, the cited passage is merely directed to the selection of antennas during signal testing events. The cited passage of Lindenmeier,

however, does not disclose storing the directional antenna identified during receipt of the preamble in association with the source address of the frame.

A.5. Using Directional Antenna Stored in Association with Destination
to Transmit Frame or Acknowledgement
(Claims 6, 8 and 17)

Claim 6, depending from claim 5 (above), states that the "data link control unit is operative to compose a frame for transmission to a destination, retrieve the antenna identifier associated with the destination address in the data structure," and "transmit control signals to the switch designating the retrieved antenna for use in transmitting the composed frame." Claim 8, depending from claim 7 (which depends from claim 5), states that the "acknowledging frame is transmitted using the directional antenna selected to receive the frame." Furthermore, claim 17, which depends from claim 16, includes "transmitting an acknowledgement frame using the selected directional antenna."

Despite the Examiner's contentions, Lindenmeier teaches a system including multiple antennas for receiving radio signals. Lindenmeier does not disclose a system according to the claimed subject matter that composes and transmits frames or acknowledges frames. Rather, the antenna diversity system taught by Lindenmeier is limited to signal reception, not transmission.

Further, the Examiner's errors with respect to claim 8 are particularly egregious as the Examiner provides no cited prior art that discloses or suggests the cited limitations. Indeed, the Examiner admits that Lindenmeier does not teach the limitations of claim 8. See Office Action at 5. See MPEP § 2143 ("the prior art reference (or references when combined) must teach or suggest all the claim limitations."); see also MPEP § 2143.03.

Moreover, despite the lack of such teaching in Lindenmeier, if the Examiner attempts to overcome the deficiency by relying on knowledge generally available to one of ordinary skill in the art, Applicants hereby request the Examiner to specifically provide evidentiary support that the limitations of claim 8 are well known in the art. See, e.g., MPEP § 2144.03 ("it might not be unreasonable for the examiner in a first Office action to take official notice of facts by asserting that certain limitations in a dependent claim are old and well known expedients in the art without the support of documentary evidence provided the facts so noticed are of notorious character and serve only to "fill in the gaps" which might exist in the evidentiary showing made by the examiner to support a particular ground of rejection. . . . It would not be appropriate for the examiner to take official notice of facts without citing a prior art reference where the facts asserted to be well known are not capable of instant and unquestionable demonstration as being well-known.") (emphasis added).

A.6. Listen Mode – Switching Between Wireless Frames until Frame Detected

(Claim 14)

Claim 14 provides that "the switch, in a listen mode, is operative to switch between the directional antennas before a wireless frame is detected."

Again, as above, the Examiner points to no prior art that teaches the subject matter of claim 14. See MPEP § 2143, 2143.03. In addition, if the Examiner attempts to overcome the deficiency by relying on knowledge generally available to one of ordinary skill in the art, Applicants hereby request the Examiner to specifically provide evidentiary support that the limitations of claim 14 are well known in the art. MPEP § 2144.03.

B. The Examiner has Failed to Properly Establish a *Prima Facie* Case of Obviousness With Respect to the Proposed Combination

Applicants respectfully submit that the rejection of claims 1-20 based on the proposed Lindenmeier-Lindsay combination is improper because the Examiner has not shown the required teaching, suggestion, or motivation in Lindenmeier, Lindsay, or in the knowledge that was generally available to those of ordinary skill in the art at the time of the invention to combine Lindenmeier, and Lindsay with each other, or to modify their teachings, as proposed.

The question raised under 35 U.S.C. § 103 is whether the prior art taken as a whole would suggest the claimed invention to one of ordinary skill in the art at the time of the invention. Accordingly, even if all elements of a claim are disclosed in various prior art references, which is certainly not the case here as discussed above, the claimed invention taken as a whole cannot be said to be obvious without some reason given in the prior art why one of ordinary skill at the time of the invention would have been prompted to modify the teachings of a reference or combine the teachings of multiple references to arrive at the claimed invention.

The M.P.E.P. sets forth the strict legal standard for establishing a *prima facie* case of obviousness based on modification or combination of prior art references. "To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references where combined) must teach or suggest all the claim limitations." M.P.E.P. § 2142, 2143. The teaching, suggestion, or motivation for the modification or combination and the reasonable expectation of success must both be found

in the prior art and cannot be based on an applicant's disclosure. See *Id.* (citations omitted). "Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art" at the time of the invention. M.P.E.P. § 2143.01. Even the fact that references can be modified or combined does not render the resultant modification or combination obvious unless the prior art teaches or suggests the desirability of the modification or combination. See *Id.* (citations omitted). Moreover, "To establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. All words in a claim must be considered in judging the patentability of that claim against the prior art." M.P.E.P. § 2143.03 (citations omitted).

The governing Federal Circuit case law makes this strict legal standard even more clear.¹ According to the Federal Circuit, "a showing of a suggestion, teaching, or motivation to combine or modify prior art references is an essential component of an obviousness holding." *In re Sang-Su Lee*, 277 F.3d 1338, 1343, 61 U.S.P.Q.2d 1430, 1433 (Fed. Cir. 2002) (quoting *Brown & Williamson Tobacco Corp. v. Philip Morris Inc.*, 229 F.3d 1120, 1124-25, 56 U.S.P.Q.2d 1456, 1459 (Fed. Cir. 2000)). "Evidence of a suggestion, teaching, or motivation . . . may flow from the prior art references themselves, the knowledge of one of ordinary skill in the art, or, in some cases, the nature of the problem to be solved." *In re Dembiczak*, 175 F.3d 994, 999, 50 U.S.P.Q.2d 1614, 1617 (Fed. Cir. 1999). However, the "range of sources available . . . does not diminish the requirement for actual evidence." *Id.* Although a prior art device "may be capable of being modified to run the

¹ Note M.P.E.P. 2145 X.C. ("The Federal Circuit has produced a number of decisions overturning obviousness rejections due to a lack of suggestion in the prior art of the desirability of combining references.").

way the apparatus is claimed, there must be a suggestion or motivation in the reference to do so." In re Mills, 916 F.2d at 682, 16 U.S.P.Q.2d at 1432. See also In re Rouffet, 149 F.3d 1350, 1357, 47 U.S.P.Q.2d 1453, 1457-58 (Fed. Cir. 1998) (holding a prima facie case of obviousness not made where the combination of the references taught every element of the claimed invention but did not provide a motivation to combine); In Re Jones, 958 F.2d 347, 351, 21 U.S.P.Q.2d 1941, 1944 (Fed. Cir. 1992) ("Conspicuously missing from this record is any evidence, other than the PTO's speculation (if that can be called evidence) that one of ordinary skill in the herbicidal art would have been motivated to make the modification of the prior art salts necessary to arrive at" the claimed invention.). Even a determination that it would have been obvious to one of ordinary skill in the art at the time of the invention to try the proposed modification or combination is not sufficient to establish a prima facie case of obviousness. See In re Fine, 837 F.2d 1071, 1075, 5 U.S.P.Q.2d 1596, 1599 (Fed. Cir. 1988).

In addition, the M.P.E.P. and the Federal Circuit repeatedly warn against using an applicant's disclosure as a blueprint to reconstruct the claimed invention. For example, the M.P.E.P. states, "The tendency to resort to 'hindsight' based upon applicant's disclosure is often difficult to avoid due to the very nature of the examination process. However, impermissible hindsight must be avoided and the legal conclusion must be reached on the basis of the facts gleaned from the prior art." M.P.E.P. § 2142. The governing Federal Circuit cases are equally clear. "A critical step in analyzing the patentability of claims pursuant to [35 U.S.C. § 103] is casting the mind back to the time of invention, to consider the thinking of one of ordinary skill in the art, guided only by the prior art references and the then-accepted wisdom in the field. . . . Close adherence to this methodology is especially important in cases where the very ease with which the invention can be understood may prompt one 'to fall victim to the insidious effect of a

hindsight syndrome wherein that which only the invention taught is used against its teacher.” In re Kotzab, 217 F.3d 1365, 1369, 55 U.S.P.Q.2d 1313, 1316 (Fed. Cir. 2000) (citations omitted). In In re Kotzab, the court noted that to prevent the use of hindsight based on the invention to defeat patentability of the invention, this court requires the examiner to show a motivation to combine the references that create the case of obviousness. See id. See also, e.g., Grain Processing Corp. v. American Maize-Products, 840 F.2d 902, 907, 5 U.S.P.Q.2d 1788, 1792 (Fed. Cir. 1988). Similarly, in In re Dembicza, the Federal Circuit reversed a finding of obviousness by the Board, explaining that the required evidence of such a teaching, suggestion, or motivation is essential to avoid impermissible hindsight reconstruction of an applicant’s invention:

Our case law makes clear that the best defense against the subtle but powerful attraction of hind-sight obviousness analysis is rigorous application of the requirement for a showing of the teaching or motivation to combine prior art references. Combining prior art references without evidence of such a suggestion, teaching, or motivation simply takes the inventor’s disclosure as a blueprint for piecing together the prior art to defeat patentability—the essence of hindsight.

175 F.3d at 999, 50 U.S.P.Q.2d at 1617 (emphasis added) (citations omitted).

As discussed above, the Examiner admits that Lindenmeier fails to disclose the claimed subject matter and relies on Lindsay to supply the missing teachings. To support the proposed combination, the Examiner merely alleges that “[i]t would have been obvious to a person of ordinary skill in the art at the time the invention was made, in view of the teaching of Lindsay, to configure Lindenmeier’s apparatus as claimed because the use of preamble [sic] in selection of signals increases the system efficiency and reduces processing time.” Office Action at 3. Notably, however, Lindenmeier actually teaches

away from antenna selection based on, and during receipt of, preambles. Specifically, Lindenmeier states that "defining a time slot for a preamble signal for the antenna election would lead to a reduction of the effective rate of transmittable data." Lindenmeier, Col. 2:5-7. Lindenmeier also appears to state that updating antenna selection only during a preamble fails to account for signal errors during transmission of data signals. Lindenmeier, Col. 2:7-17. Indeed, Lindenmeier appears to teach signal testing and antenna selection at a frequency determined on the order of FDM or QPSK symbols, rather than frames. See Lindenmeier, Col. 7:66 – Col. 8:66; see also Col. 11:46-63. Accordingly, even assuming that Lindsay teaches antenna selection during frame preambles, Lindenmeier teaches away from the proposed Lindenmeier-Lindsay combination.

Furthermore, Lindenmeier teaches a system that is directed to maximizing the probability of radio frequency coverage over a given area by using multiple, overlapping antenna patterns in connection with both satellite AND terrestrial radio frequency signals. The teachings of Lindenmeier teach away from the present invention. Specifically, the present invention minimizes the overlap in antenna patterns by orienting the antennas radially about an axis and directing the peak gains, radially and outwardly about the axis, at angles intended to minimize antenna pattern overlap. The resulting sectorization increases the signal to noise ratio (SNR) of a signal between two wireless nodes, especially under heavy load conditions. Since better SNRs increase the effective data rate, this arrangement increases the capacity of the network. However, the increase in capacity generally occurs at the expense of radio frequency coverage.

Moreover, nowhere does the Examiner demonstrate that a person having ordinary skill in the art at the time of the invention would have reasonably expected the proposed combination to achieve the purported results. First, nowhere does the Examiner demonstrate that the proposed combination would have in fact produced the purported

results. For example, nowhere does the Examiner even attempt to demonstrate that the combination, including the modification not taught by any cited reference, would have achieved the purpose of "increasing efficiency and reducing processing time." In addition, even assuming for the sake of argument that the proposed combination would have produced the purported results, nowhere does the Examiner demonstrate that a person having ordinary skill in the art at the time of the invention would have reasonably expected such results. As an example, the Examiner merely asserts that modifying Lindenmeier as alleged would have achieved the purpose of increasing efficiency and reducing processing time, without even attempting to demonstrate that a person having ordinary skill in the art at the time of the invention would have reasonably expected such result. If the Examiner intends to rely on information that was generally available to a person having ordinary skill in the art at the time of the invention to demonstrate that the purported results of the proposed combination would have been expected by a person having ordinary skill in the art at the time of the invention, Applicant respectfully requests that the Examiner provide documentary evidence that such information was in fact generally available to a person having ordinary skill in the art at the time of the invention, as required by the M.P.E.P. and governing Federal Circuit case law.

For at least these reasons, Applicants respectfully submit that the Examiner has not established a prima facie case of obviousness against claims 1-20. Applicants respectfully request reconsideration and allowance of claims 1-20.

In light of the foregoing, Applicant believes that all currently pending claims are presently in condition for allowance. Applicant respectfully requests a timely Notice of Allowance be issued in this case. If the Examiner believes that any further action by Applicant is necessary to place this application in condition for allowance, Applicants

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request a telephone conference with the undersigned at the telephone number set forth below.

Date: June 22, 2006

Respectfully Submitted,
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